

A Software-Assurance Design Approach for NextGen Enabling Technologies, Phase II

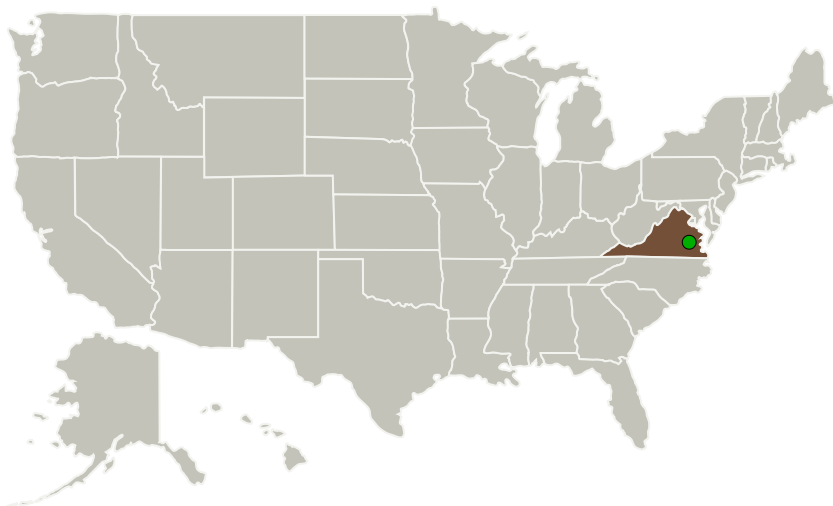
Completed Technology Project (2011 - 2013)



Project Introduction

The United States air transportation system is not performing adequately even as aircraft operations increase. To address this problem, the Federal Aviation Administration and the Joint Planning and Development Office are developing the Next Generation Air Transportation System (NextGen). NextGen will enable critical advances to the current management of the National Airspace (NAS). The technologies that comprise NextGen offer the possibility of compelling new systems of systems that, if properly designed, will not only enhance the capabilities of the NAS but also improve its safety. At the same time, these fundamental changes bring with them implications for safety and security. In order to address these concerns, new techniques for the certification of software systems will be required to ensure that certification cost will not limit the safety innovations offered by NextGen advances. In Phase I, Barron Associates investigated the integration of ADS-B and TCAS as a representative NextGen system of systems and investigated the application of the system safety case to the system. In the proposed Phase II research, Barron Associates will develop a new collision-avoidance system and conduct an empirical study of the system safety case compared to DO-178B compliance as a certification approach. Throughout the development of the new collision-avoidance system, evidence in support of DO-178B compliance as well as in support of the safety case will be gathered. Using the data from this evidence collection together with the data collected during development, the team will answer key research questions that center on the use of the system safety case as an alternative means for airworthiness certification.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Barron Associates, Inc.	Lead Organization	Industry	Charlottesville, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Virginia

Project Transitions

June 2011: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138646>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Barron Associates, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

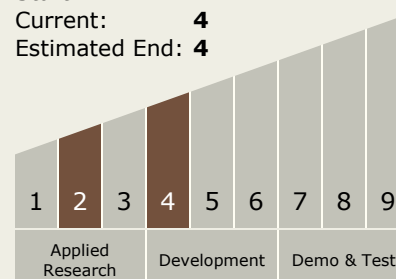
Michael Aeillo

Technology Maturity (TRL)

Start: 2

Current: 4

Estimated End: 4



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
 - └ TX16.2 Weather/Environment

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System